HISTORICAL NOTES

Medical Subject Headings (MeSH)

In 1960, medical librarianship was on the cusp of a revolution. The first issue of the new *Index Medicus* series was published. On the horizon was a computerization project undertaken by the National Library of Medicine (NLM) to store and retrieve information. The Medical Literature Analysis and Retrieval System (MEDLARS) would speed the publication process for bibliographies such as *Index Medicus,* facilitate the expansion of coverage of the literature, and permit searches for individuals upon demand [1]. A new list of subject headings introduced in 1960 was the underpinning of the analysis and retrieval operation.

This year marks the fortieth anniversary of the initial publication of Medical Subject Headings (MeSH) [2]. MeSH was a new and thoroughly revised version of lists of subject headings compiled by NLM for its bibliographies and cataloging [3]. Frank B. Rogers, NLM director, announced several innovations as he introduced MeSH in 1960.

> The adoption of a single subject authority list for both books and periodical articles is a departure from traditional practice. We take the view that subject cataloging and periodical indexing, as exemplified in the *Index Medicus* and in the *NLM Catalog,* are identical processes in their major dimensions. A single list can and should be used for both purposes. This has two major virtues: simplicity for users, in requiring familiarity with only a single scheme; and economy to the Library in the development and maintenance of a single scheme . . . . There is another departure from traditional practice represented in this list. This is the adoption of standard topical subheadings for cataloging books, as well as for indexing periodical articles . . . . The topical subheading is in effect a substitute for a phrase heading, and on the whole it is a preferable substitute . . . . The main heading-topical subheading combination is a pre-coordination of terms, reducing the problem of term permutation, which looms large in most manual retrieval systems in book form. [4]

Three years later, the second edition of MeSH was distributed as part of the 1963 *Index Medicus.* Winifred Sewell described the changes made in anticipation of the introduction of MEDLARS to accommodate its use for both machine searching and publication.

> Though the number of subject headings in the second edition was a third greater than the number in the first edition, we followed the basic principles of assigning subject headings in medicine as set forth in the first edition. We are convinced of the value of using an identical authority list for the indexing of periodicals and the cataloging of books, and we regard subject headings as directional signals or vectors which, with other headings, serve to locate the essence of a particular paper or book in the universe of medical information. Rarely will a single subject heading encompass the total content of a citation.
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> The advent of MEDLARS added two criteria to those used for earlier medical subject heading lists. By providing for much greater coverage and deeper indexing, it thus increased the need for specificity in descriptors. In addition it became possible not only to search for a single heading, . . . but also to include, in the search for that concept, all the specific terms that are comprehended in the meaning of the larger term . . . . This capability necessitated a delineation of all hierarchical relationships in the system. [5]

Several major changes were made in response to these criteria. First, the terms in the list were sorted into broad categories, and categorized lists of terms were published to enable the user to find related terms. For headings that had attracted a large number of citations, more specific terms and precoordinated headings were introduced. The use of subheadings was discontinued, based on its effect on the printed *Index Medicus* (a decision that would later be reversed) [6, 7].

From its beginning, MeSH was intended to be a dynamic list, with procedures for recommending and examining the need for new headings [8–11]. The content of the vocabulary related to the usage of terms in the literature itself and evolved to meet new concepts in the field [12]. The use of the computer made revisions more practical and systematic, despite the difficulty in updating printed indexes and card catalogs.

Forces today are pushing MeSH toward a new approach to organizing medical knowledge and information [13]. The non-mediated search requires simplification of MeSH by such means as eliminating most qualifiers and expanding entry terms and synonyms from natural language that map to subject headings. Translations of MeSH into other languages will also be linked to enable more efficient access for non-English speakers. An explosion of material, in all formats, to be organized has resulted from the Internet. This and the integration of other databases into MEDLINE increase the need to expand the coverage of MeSH and make it more universally approachable. The maintenance environment of MeSH will be the same as that of the Unified Medical Language System (UMLS) Metathesaurus to facilitate the import and export of terms. MeSH is evolving toward a concept-based system, rather than a term-based one. In this structure, the descriptor class, or set of related concepts, will include additional

information about attributes of concepts and their relationship [14].

MeSH was a pioneering effort as a controlled vocabulary that was applied to early library computerization. Its impact on the organization and retrieval of health information has been enormous. In a broader sense, its alphabetical and hierarchical structures have been recognized as models for other thesauri [15, 16]. Even with advances in automation and resulting changes in the capabilities of indexing and searching, an important role remains for MeSH in organizing information in a way that provides precision and power in retrieval.

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